

REMARKS

Claims 1-4, 43-44, and 58-59 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Russell et al. (U.S. Patent No. 6,254,716) and further in view of Omagari (JP 2000-258746) and Fujikawa (JP 05-326452). In response, Applicants amended the independent claims to clarify that the control device has a plurality of attraction modes including a vacuum attraction mode in which the vacuum chuck device is activated and an electrostatic attraction mode in which an electrostatic chuck device is activated, and that a control device controls the attraction modes based on the pressure in the treatment chamber, and respectfully traverse.

Russell is directed to an apparatus and method for use in the manufacture of a multiple layer optical disc. As illustrated in FIG. 1, a processing chamber 22 includes an upper disc support 24 and a lower disc support 26. A disc 28 is clamped by the upper disc support 24 and is positioned between the lower and upper disc supports 24, 26 using suction.

However, Russell fails to disclose two holding units that generate pressure and electrostatic force for holding substrates. Russell also fails to disclose or suggest controlling attraction modes based on a pressure in the processing chamber 22. In addition, the apparatus disclosed by Russell is not designed for manufacturing a panel display and does not address the problem of preventing deformation of the disc or substrates, as does the present invention.

Omagari discloses a substrate laminating device that includes a lower plate 6 and an upper plate 8. Only the upper plate 8 includes a vacuum chuck device for holding a substrate. Omagari does not disclose or suggest a control device controlling attraction modes based on the pressure in the treatment chamber, as now recited in the amended claims.

Fujikawa discloses a plasma treatment apparatus that includes a gas showering element 8 and a substrate holder 2. The substrate holder 2 has an electrostatic chuck 4 and a vacuum pipe 3. Fujikawa teaches to attract the substrate 1 that is to be treated at a high vacuum range between 10^{-4} to 10^{-5} Torr in order to prevent plasma from generating at a gap between the process substrate 1 and the surface of a holder (chuck device) 12. *See* paragraphs [0003] and [00015]. However, Fujikawa does not disclose or suggest a control device that controls attraction modes based on a pressure in a chamber, as now recited in the amended claims.

In contrast, the present invention includes a control device that has a plurality of attraction modes including a vacuum attraction mode in which a vacuum chuck device is activated and an electrostatic attraction mode in which an electrostatic chuck device is activated. The control device controls the attraction modes based on the pressure in a treatment chamber. Each of the above references fails to disclose or suggest a control device that controls attraction modes based on the pressure in a treatment chamber. Therefore, the combination of the references also fails to disclose such a control device.

More specifically, the present invention is directed to an apparatus for manufacturing a panel display, such as a PDP and an LCD, including first and second substrates bonded to each other. In the manufacturing process of such a panel display, two large substrates are held by two holding devices and are bonded to each other with a predetermined gap. To bond the two substrates with high accuracy, two holding devices are required to keep the substrates flat so the substrates are parallel to each other. However, it is difficult to keep the substrates flat because each of the substrates of the panel display are thin

and easily deformed. Thus, the substrates can be deformed by an attraction pressure that is locally applied on the surface of each substrate. This deformation may cause separation of the substrate from the holding device, misalignment of the substrates, and therefore a defect in the panel display. Accordingly, there is a demand for holding the substrates of the panel display in position without deforming the substrates even when the substrates are relatively large.

The present invention overcomes the deformation problem by including a control device 84 that has a plurality of attraction modes including a vacuum attraction mode and an electrostatic attraction mode. The control device controls the attraction modes (i.e., selects one of the attraction modes) based on a pressure in a treatment chamber 71. In particular, when the treatment chamber 71 is depressurized, the control device activates at least the electrostatic chuck device 76a, 76b and equalizes the pressure applied by each vacuum chuck device with the pressure in the treatment chamber.

Because the attraction pressure is equalized with the pressure in the treatment chamber and the substrates are bonded in the evacuated treatment chamber, the formation of the substrates due to the attraction pressure is prevented.

None of the prior art references teaches using a controller to control attraction modes based on the pressure in the treatment chamber. Thus, even if the prior art references are combined, substantial reconstruction and/or redesign of the prior art references is required to arrive at the present invention. Furthermore, none of the cited references addresses the problem of the present invention, namely preventing deformation of the substrates. Therefore, there is no motivation to combine the references to solve the problem

of the present invention. For all of these reasons, withdrawal of the §103 rejection is respectfully requested.

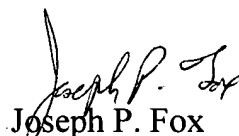
New claim 60 is added for consideration. Support for claim 60 can be found in FIG. 7, which shows a pressure equilibration line 81a, 81b, a pressure equilibration valve 82a, 82b, and a depressurization line 78a, 78b. Applicants earnestly solicit allowance of new claim 60.

For all of the foregoing reasons, Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

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